

Health Defects and Need for Treatment of Adolescents in Low Income Families

ARTHUR J. SALISBURY, M.D., M.P.H., and ROBERT B. BERG, M.D., M.P.H.

PLANNING for new services to improve the health of children in low income families has been made difficult by the scarcity of published information regarding the number and type of the health defects which can be expected to be observed in these children. The results of examinations in schools are diluted to an undetermined degree, because they combine data on poor children and those from more affluent families (1). The reports of the causes of rejection in Selective Service examinations, although probably representative of health problems in the lower income groups, do not include information on girls (2). The Head Start program has produced considerable data for both boys and girls of preschool age (3), but this information may not be applicable to older children.

If some of the variables which seem to affect health status could be defined and considered in the planning process, planning could be facilitated. Planning could also become more specific by applying the improved knowledge of the factors that act to determine the need for services and treatment.

This analysis is intended as a possible aid to more exact planning.

Methods

The results of physical examinations on 618 children, 14 to 16 years old and descriptive data regarding these children, including five others

who did not complete the examination, are discussed. These children were examined in July 1966 as part of the summer work program conducted by Action for Boston Community Development, Inc., the antipoverty agency for the city of Boston, Mass. All the children in this program were from low income families and lived within the boundaries of municipal Boston. All had attended school during the year before their enrollment in this program.

Selective factors determined to a degree the composition of the group. First, the enrollees were motivated either by their families or by themselves to take advantage of the offer of summer employment. Second, recruitment for the program was by referral from churches, schools, welfare workers, boys' and girls' clubs, and other sources. Thus, these children did not come from the hidden poor, and the recruitment procedure probably tended to select those children who were believed to be most likely to continue with and to profit most from an 8-week program of summer employment.

The children were directed to appear at the

Dr. Salisbury is a pediatrician and consultant in maternal and child health to the Massachusetts Committee on Children and Youth, Boston. Dr. Berg is chief of pediatrics, Beth Israel Hospital, Boston, and assistant professor of pediatrics at Harvard Medical School.

outpatient department of a Boston hospital according to a schedule. Parental permission for the examination was obtained, and the parents completed a brief questionnaire regarding the child's health history. Only portions of the data from this questionnaire are included in this report. Only a few parents accompanied their child to the examination.

A record was started for each child at the time of the examination. This record included and amplified some of the identifying and descriptive information supplied by the parents. Nonmedical employees of the sponsoring agency obtained and recorded additional information.

Height, weight, blood pressure, and visual acuity (using Snellen's literate chart only) were determined by a nurse.

Seven physicians, six of whom were pediatricians, served as examiners. One pediatrician examined the head and neck, including dentition, of every child, and the child was then sent to one of the other physicians to complete the examination. The children removed all clothing except underwear in the privacy of curtained cubicles. Approximately 10 minutes were spent examining each child. The external genitalia of the girls were not examined, and the presence or absence of inguinal hernia was determined only for the boys.

After recording his observations and reviewing those recorded by the nurse and by the physician who examined the head and neck, each examiner recorded his recommendations regarding the need for further investigation and followup care of the abnormalities discovered. In making this recommendation, the physician considered the child's history obtained from parents, the response to questions asked the child, and his subjective conclusions regarding the past and current management of the disorder.

Laboratory studies, X-rays, and tests for tuberculosis were not included in this examination. Aural acuity was estimated only grossly. No attempt was made to assess the emotional health or mental capabilities of the children.

Basis for Analysis

The results and recommendations appearing on all the records were reviewed, summarized, and coded for tabulation by one of the authors, Dr. Salisbury, with clerical assistance. In not

more than five instances was further information regarding the status of care of an abnormality sought and obtained from parents by telephone in order to make a decision regarding the necessity for further care and followup. For all other abnormalities, recommendations of the examining physician were followed in tabulating these results.

The classification of abnormalities as major or minor was, with certain exceptions, largely done in terms of the authors' objective experience and subjective interpretation. The degree and type of the existing functional handicap, the likelihood of progressive disability, and the estimated extent to which medical and other resources would be required to alleviate or eliminate the abnormality were considered.

The criteria employed in the classification of the observations as either normal or no abnormality, minor abnormality, or major abnormality are not reproduced here but are available from the authors.

Descriptive Data

A total of 623 children were examined. Of these, 343 were boys and 280 girls. Results were incomplete for five children because they did not finish the examination or some of the results were not recorded. Descriptive data, however, were recorded for all 623 of them.

Sex. The participation of more boys (55.1 percent of the group) probably reflects the increased personal desire of boys to become wage earners at this age and possibly also the desire of parents to have boys contribute to their own support as soon as possible. Appropriate job opportunities were available equally to boys and girls.

Reciprocity of public assistance. Two hundred sixty-four or 42 percent of the children were members of families receiving public assistance through Aid to Families with Dependent Children (AFDC) or other categorical programs. It was not determined if or when any of the other 359 (58 percent) had received assistance from AFDC in the past or if any of the children lived in families who received non-categorical assistance. All the children, however, were members of families whose income was low enough to qualify for programs of the Office of Economic Opportunity.

The usual sources of medical and dental care were as follows:

<i>Usual source</i>	<i>Number</i>	<i>Percent</i>
Medical care:		
Physician in private practice . . .	86	13. 8
Voluntary hospital	133	21. 3
Public hospital	334	53. 6
Government and other hospitals . .	14	2. 2
None	40	6. 4
Two or more of these sources	16	2. 6
Dental care:		
Dentist in private practice	160	25. 7
Dental school clinic	75	12. 0
Public hospital clinic	134	21. 5
Voluntary hospital clinic and government hospital clinic	26	4. 2
Health department clinic	101	16. 2
Other and none	40	6. 4
No response	87	14. 0

Dental observations. The single examining physician, using only a tongue blade and light for examination, discovered severe, untreated dental disease in 29 percent or 181 of the children. In the remaining 442, or 71 percent, dental disease was absent or not major, or the child was under care which was judged to be or had been adequate.

Thus, the discovery that 29 percent of the children required extensive dental treatment must be regarded as conservative, because the examination was not made by a dentist or dental hygienist, and it is emphasized that a large, but undetermined, number of the other 71 percent were not free of dental disease.

Medical observations. The following results, classified as described previously, were noted. Results of dental examinations are excluded in the following text table and subsequent tables.

<i>Classification</i>	<i>Number</i>	<i>Percent</i>
No medical abnormality	324	52. 0
One or more minor abnormality, no major abnormality	202	32. 4
One or more major abnormality, no minor abnormality	92	14. 8
Not classified, incomplete examination	5	. 8
Total	623	100. 0

Of the 373 abnormalities noted, 99 were classified as major, and 274 as minor (table 1). These 373 abnormalities were observed in 294 or 47.5 percent of the children.

In the overall, 144 (40 percent) of the 373 abnormalities were judged to have received inadequate care. The treatment of 34 percent of the minor abnormalities and of 52 percent of

the major abnormalities was judged to be inadequate.

The numbers of major and minor abnormalities are listed in table 2.

Predictive Factors in Planning Services

The results of the dental and medical examinations have been analyzed for variables of sex, source of care, and existence of a financial barrier to obtaining services. These analyses were made to test the possibility that any of these variables might prove to be of value in predicting the type and extent of care and treatment which will be required in treating physical defects of adolescents in low income families.

Sex and dental disease. Of the 623 children, 181 had severe untreated dental disease, and 442 had no major problems. Only 49 (17.5 percent) of the girls, but 132 (38.5 percent) of the boys had severe, untreated dental disease. A total of 231 girls (82.5 percent) had no major dental difficulty as compared with 211 (61.5 percent) of the boys.

There is a significant difference ($P < 0.0005$) in the prevalence of severe, untreated dental disease among the boys and the girls. The lower rate of untreated dental disease among girls may possibly be explained by the increased importance attached to appearance by girls and their families, but there are other possible variables including diet, hygiene, and smoking habits which might produce a decreased incidence of caries and other disorders, as well as better care of such conditions, among girls.

This discovery indicates that planning for treatment of dental disease in these children should be based on the likelihood that the resources (funds and personnel) needed for boys

Table 1. Adequacy of care and treatment of major and minor abnormalities

<i>Abnormality</i>	<i>Adequate</i>		<i>Inadequate</i>		<i>Total</i>
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	
Major	45	48	54	52	99
Minor	184	66	90	34	274
Total	229	60	144	40	373

will be approximately double those needed for girls.

Sex and medical abnormalities. The examination of the boys was more complete than that of the girls in that the external genitalia of the girls were not examined, and the presence or

absence of inguinal hernia was not determined. Table 3 shows the distribution of major and minor abnormalities and comparative evaluation and treatment, or both, in the 618 children with complete observations after exclusion of the results of the two procedures in the boys.

Table 2. Major and minor abnormalities, rate of prevalence, and percent of abnormalities inadequately treated of 618 Boston children

Description	Number	Percent of abnormalities	Percent receiving inadequate care
Major abnormalities.....	99	100.0	52
Vision—acuity less than 20/70 in one or both eyes.....	38	38.3	37
Lungs—arrested tuberculosis, chronic cough, incapacitating asthma, repeated “pneumonia”.....	14	14.1	57
Bones, joints, muscles—any abnormality of spine and large joints.....	12	12.1	67
Hypertension—systolic over 140 mm. Hg., diastolic over 100 mm. Hg., or both.....	8	8.8	100
Heart—diastolic murmur, systolic murmur with history and observations suggesting heart disease.....	5	5.5	40
Hearing—gross deafness on examination and known history of hearing difficulty.....	4	4.4	25
All other ¹	18	16.8	83
Minor abnormalities.....	274	100.0	34
Vision—acuity less than 20/40 but better than 20/70 in one or both eyes.....	78	28.4	17
Skin—nondisfiguring lesions resolving without scars.....	36	13.0	22
Development, nutrition—moderate obesity.....	35	12.8	29
Bones, joints, muscles—asymptomatic abnormalities of feet or hands.....	32	11.7	11
External genitalia (boys only)—hypospadias without history or findings of renal disease, hydrocele, varicocele, phimosis.....	24	8.7	50
Heart—systolic murmur without other findings of heart disease.....	12	4.4	58
Hearing—record of abnormal audiogram with no discernible gross deafness.....	12	4.4	100
Other ²	45	16.9	53

¹ Includes inguinal hernia, seizures, aural discharge, keratitis, and marked obesity.

² Includes umbilical hernia, conjunctivitis, nasal obstruction, enlarged tonsils, and infrequent and mild asthma.

Table 3. Distribution and the need for evaluation and treatment of major and minor abnormalities among 338 boys and 280 girls

Category	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Major and minor abnormalities.....	338	100.0	280	100.0	618	100.0
One or more major abnormality, no minor abnormality.....	59	17.8	31	11.1	90	14.6
One or more minor abnormality, no major abnormality.....	74	21.9	104	37.1	178	28.8
No abnormality.....	205	60.3	145	51.8	350	56.6
Evaluation and treatment.....	338	100.0	280	100.0	618	100.0
Inadequate evaluation and treatment.....	76	22.5	38	13.6	114	18.4
Adequate evaluation and treatment or no abnormality.....	262	77.5	242	86.4	504	71.6

Table 4. Dental health status of Boston children according to usual source of dental care

Source of care	Severe, untreated disease		No major problems		Total
	Number	Percent	Number	Percent	
Dentist in private practice.....	24	15.0	136	85.0	160
Dental school clinic.....	19	25.3	56	74.7	75
Public hospital clinic.....	60	44.8	74	55.2	134
Voluntary or government hospital clinic..	8	30.8	18	69.2	26
Health department clinic.....	28	27.7	73	72.3	101
Other and none.....	11	27.5	29	72.5	40
No response.....	31	35.6	56	64.4	87
Total.....	181	29.0	442	71.0	623

The differences in major abnormalities by sex in table 3 are significant ($P < 0.0005$) indicating that boys are more likely than girls to have major abnormalities, although girls are more likely to have minor abnormalities.

Table 3 also shows the comparative need for further evaluation and treatment of abnormalities, or both (major and minor combined), among boys and girls. Again, the differences in evaluation and treatment are significant ($P < 0.0005$) indicating the need for more treatment resources for boys.

Source of care for dental disease. The distribution of severe, untreated dental disease according to the usual source of dental care is

shown in table 4. The difference noted in the rates of severe disease in the seven groups are significant ($P < 0.0005$). These rates vary from a low of 15 percent for children receiving care from practitioners in private practice to 45 percent for children who receive their dental care at public hospital clinics. Thus, variations in needs for treatment resources can be predicted, if such information is available in advance for program planning.

Source of care for medical abnormalities. Table 5 shows the distribution of inadequately evaluated or treated abnormalities according to the usual source of medical care. The differences ($P > 0.700$ and $P < 0.849$) are not significant and, therefore, knowing the source of care does not aid in predicting the need for further evaluation and treatment of abnormalities.

Financial barriers to treatment. This group of children was composed of those in families receiving public assistance and those whose families, although having very low incomes, were not receiving such assistance. At the time these studies were made there was no program of medical assistance in Massachusetts for the medically indigent except for those receiving public assistance.

The medical assistance program for welfare recipients was broad and comprehensive, and any needed service was obtainable without cost to the family. This situation provided an opportunity to compare the need for dental and medical care in the recipient group, for whom there was no financial barrier, with the need in the nonrecipient group, who at that time were

Table 5. Distribution according to usual source of medical care of inadequately evaluated or treated abnormalities

Source of care	Evaluation and treatment inadequate		Evaluation and treatment adequate or no abnormality		Total	
	Number	Percent	Number	Percent	Number	Percent
Physician in private practice.....	20	15.6	65	13.3	85	13.8
Voluntary hospital.....	27	21.1	105	21.4	132	21.3
Public hospital.....	68	53.1	264	53.7	332	53.6
Other.....	3	2.3	11	2.2	14	2.2
None.....	9	7.0	30	6.3	39	6.4
Two or more of above.....	1	.8	15	3.1	16	2.6
Total.....	128	100.0	490	100.0	618	100.0

not eligible for financial assistance in meeting medical and dental costs.

Table 6 shows the prevalence of severe, untreated dental disease and comparative need for care of medical abnormalities among recipients and nonrecipients of public assistance.

The difference between the recipient and non-recipient groups in the care of severe untreated dental disease is not significant ($P > 0.317$). This difference indicates that the absence of a preexisting financial barrier to obtaining dental care does not diminish the estimate of needs for treatment in these children.

The difference in comparative need for care of medical abnormalities is not statistically significant ($P > 0.157$). This fact indicates that the need to provide for further and additional care of medical abnormalities cannot be predicted by the presence or absence of a financial barrier.

Discussion

These results, like those of other studies, show the great prevalence of medical and dental abnormalities in children in low income families. These results alone are not sufficient to describe the health status of these children. The needed additional dimension has been supplied by the numbers of abnormalities judged to require further evaluation and treatment. The magnitude of the requirements for followup and treatment resources can be estimated with considerable accuracy if these results are confirmed by other studies.

Among the three factors—sex, source of care, and presence of a financial barrier—analyzed for their effect on health status, the sex of the child seems to be most useful in predicting

health service needs. The source of dental care also seemed to be of significance in this group of children. Although the absence of a financial barrier might be expected to affect health status favorably, no such correlation was demonstrated.

Many other factors undoubtedly influence the health status of adolescent children in low income families and in all other families. Among these factors are availability and accessibility of care, health attitudes in varying cultural settings, and the effect of other medical and social difficulties in the family which compete for attention. The determination of the effect of these and other factors would further facilitate planning efforts.

The intention of this report was not to discuss the implications regarding the ineffectiveness of existing systems and programs of medical and dental care which these observations reveal. Apparently existing systems and services must be changed and improved if we are to eliminate the unnecessary and unjust association of poverty and ill health.

Summary

Adolescents in a summer work program in Boston, Mass., were given physical examinations in July 1966. Examinations of 618 of the 623 children, 14–16 years old, were completed. Families of 264 children received public assistance through Aid to Families with Dependent Children; the families of all children, however, had incomes low enough to qualify for programs of the Office of Economic Opportunity.

The prevalence of major and minor physical abnormalities and of severe dental disease was

Table 6. Prevalence of severe, untreated dental disease, and need for care of medical abnormalities among recipients and nonrecipients of public assistance

Classification	Recipient		Nonrecipient		Total	
	Number	Percent	Number	Percent	Number	Percent
Dental disease.....	264	100.0	359	100.0	623	100.0
Severe, untreated disease.....	72	27.3	109	30.4	181	29.0
No major problem or adequately treated.....	192	73.7	250	69.6	442	71.0
Care, evaluation, and treatment of medical abnormalities.....	262	100.0	356	100.0	618	100.0
Inadequate.....	49	18.7	79	22.2	128	20.7
Adequate or no abnormality.....	213	81.3	277	77.8	490	79.3

determined. In addition, physical abnormalities were classified according to the adequacy or inadequacy of their treatment. The prevalence of severe dental disease and of physical abnormalities was analyzed in relation to sex, usual source of care, presence of a financial barrier, and adequacy of treatment.

A total of 373 physical abnormalities was observed in 294 or 47.5 percent of the children. Of these, 99 were classified as major, such as poor vision, diastolic heart murmur, and hypertension, and 274 as minor, for example, some hearing deficiency, moderate obesity, and systolic murmur without other observations of heart disease. Fifty-two percent of the major and 34 percent of the minor abnormalities were judged to have been treated inadequately.

Twenty-nine percent of the children required extensive dental treatment, and a large but undetermined number of the other 71 percent were not free of dental disease.

Major abnormalities were observed with significantly greater frequency among boys than among girls, but the reverse was true of minor

abnormalities. Inadequacy of treatment of all abnormalities was significantly greater among boys as was the prevalence of severe dental disease.

Severe dental disease was observed less frequently in those children whose usual source of care was a dentist in private practice. The adequacy of treatment of medical abnormalities is not predictable by the source of care.

The absence of a preexisting financial barrier does not favorably affect the health of these children.

REFERENCES

- (1) Rogers, K. D., and Reese, G.: Health studies—presumably normal high school students, I. Physical appraisal. *Amer J Dis Child* 108: 572-600 (1964).
- (2) U.S. President's Task Force on Manpower Conservation: One third of a nation; a report on young men found unqualified for military service. Washington, D.C., 1964.
- (3) Mico, P. R.: Health services in project Head Start, Boston, 1965. Action for Boston Community Development, Boston, 1966. Mimeographed.

National Library of Medicine Bibliographies

Bibliographies on specific biomedical subjects are published periodically by the Public Health Service's National Library of Medicine. Prepared by MEDLARS in response to requests from physicians, researchers, and educators, these bibliographies are available to interested health professionals on request. They may be obtained (request by number) from the National Library of Medicine, 8600 Rockville Pike, Bethesda, Md. 20014.

1-69. Psychotherapy in alcoholism. January 1964-August 1968. 160 citations.

2-69. Psychotherapy in drug addiction or abuse. January 1964-

August 1968. 50 citations.

3-69. Psychotropic drug addiction or withdrawal symptoms in man. January 1964-August 1968. 207 citations.

4-69. Cannabis toxicology. January 1964-August 1968. 55 citations.

5-69. Heart transplantation in man. January 1964-August 1968. 180 citations.

6-69. Kidney transplantation in man. January 1964-June 1968. 651 citations.

7-69. Progestational or estrogenic hormones and human lipid metabolism. January 1964-August 1968. 51 citations.

8-69. Programs for rehabilitation of the aged. January 1964-August 1968. 115 citations.

9-69. Sarcoidosis. January 1966-December 1968. 546 citations.